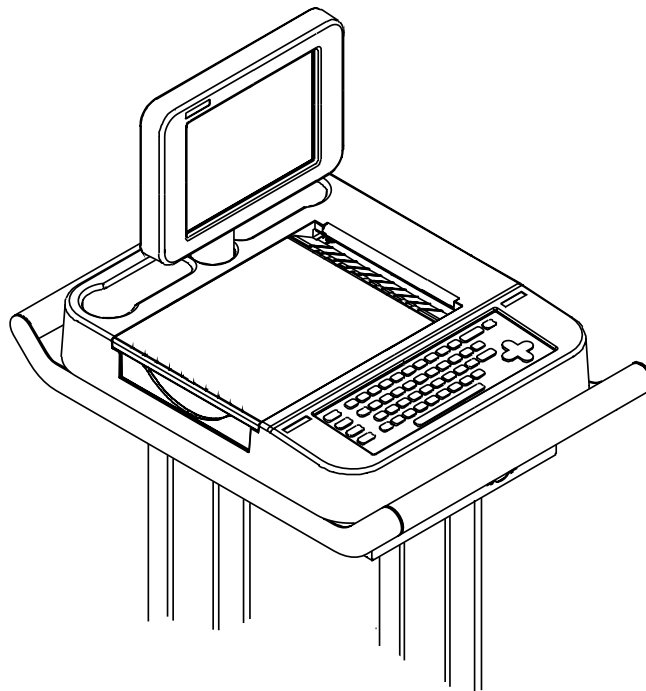


Service Manual



Eclipse™ Premier Electrocardiograph

Part No. 070-1150-00 Rev. A

TO RESPONSIBLE SERVICE PERSONNEL:

The contents of this document are not binding. If any significant differences between the product and this document are encountered regarding service work, contact Quinton Cardiology, Inc. for further information.

Quinton Cardiology, Inc. recommends the use of authorized Quinton Cardiology personnel for the maintenance and repair of all Quinton Cardiology equipment. Quinton Cardiology, Inc. cannot warrant the operation of the equipment if other than Quinton Cardiology genuine replacement or exchange parts are used in the service or repair of this equipment, and if such service or repair is performed by non-authorized personnel.

This product has been carefully designed to provide a high degree of safety and dependability. However, we can not guarantee against the deterioration of components due to aging and normal wear.

CAUTION — The Eclipse Premier ECG is a restricted device. Federal law restricts the sale, distribution, or use of this device to, by, or on the lawful order of a health professional.

DANGER — Explosion hazard. Do not use this device in the presence of flammable anesthetics.

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Warnings, Cautions & Notices



Warnings

WARNING: This device is NOT intended for unattended or continuous patient monitoring. It is intended for short-term ECG waveform acquisition. There are no audible or visible alarms.

WARNING: Never remove the battery pack and attempt to recharge it using an external battery charger. Fire or explosion may result.

WARNING: Explosion hazard. Do NOT use in the presence of flammable anesthetics.



WARNING: Electrical shock hazard. Do NOT contact unit or patient during defibrillation. Otherwise, serious injury or death could result.

WARNING: NEVER position defibrillator paddles very close to or over ECG sensors. Remove all chest sensors (V-Leads/C-Leads) from a patient before defibrillation to allow proper paddle placement. Severe burns may result from improper placement of defibrillator paddles. Before using any defibrillator, consult the operating instructions for that equipment.

WARNING: Electrical shock hazard. Operate the unit from its battery supply if the integrity of the protective earth conductor is in doubt. Otherwise, serious injury or death could result.



WARNING: Hazardous voltage. To reduce the risk of electrical shock, do not attempt to remove the cover under any circumstances. Refer servicing to a qualified technician.

WARNING: If safety procedures not performed, increased risk to patient and device can occur.

Cautions

CAUTION: Federal law restricts this device to sale by or on the order of a physician.

CAUTION: The unit must be operated only at the line voltage and frequency specified on the rating plate.

CAUTION: Although the Eclipse Premier is designed to meet IEC 601-1-2 EMC immunity requirements, the presence of strong EMI fields generated by electronic, surgical or diathermy instruments in close proximity to the unit may cause trace noise or input overload conditions.

CAUTION: Fire hazard. Use only approved battery packs. Replace battery pack with the battery specified on the label inside the battery compartment.

Notices

NOTICE: Do not place used battery pack in your regular trash. The incineration, landfilling, or mixing of NiCad batteries with municipal waste is PROHIBITED BY LAW in most areas. Return this battery pack to a government-approved battery recycler. Contact your local waste management officials for more information.

NOTICE: Computer assisted interpretation is a valuable tool when used properly. However, no automated interpretation is completely reliable and interpretations should be reviewed by a qualified physician before treatment, or non-treatment, of any patient.

NOTICE: Because the Eclipse Premier offers different lead configurations, always ensure that the appropriate lead placement is employed for the lead configuration selected.

NOTICE: Waveforms displayed on the Eclipse Premier screen are not intended to be used for diagnostic purposes. Use displayed waveforms to assess signal quality only.

NOTICE: Damage caused by using unapproved recording paper may void your warranty. Your Eclipse Premier electrocardiograph is intended for use with approved ECG supplies; its reliability and performance are directly affected by the supplies you use.

Definitions of Symbols Used

Safety Symbols



Attention. Consult accompanying documents.



Danger! High voltage.



Hazardous voltage.



Defibrillation-Protected Type CF Equipment.



Equipotentiality (used to label the grounding lug).



Meets or exceeds Council Directive 93/42/EEC, MDD, Class IIa.

Labeling Symbols



Alternating Current (AC)



Automatic Operation



Custom Lead Triplet



Frequency Response



Heart Rate



Input/Output Connection



LCD Screen Contrast






Manual Operation



On/Standby



Stop Function

	Serial port
I/O	
	Battery Compartment
	Battery Charge Status
	Modem
RJ11	Modem

About the Eclipse™ Premier Electrocardiograph

The Eclipse™ Premier ECG is a multichannel interpretive electrocardiograph. You operate the electrocardiograph by pressing various keys on the keyboard. A thermal printer makes hard copy printouts of text and waveforms for permanent records. The electrocardiograph can transmit and receive ECG records when used with other compatible equipment. See your Operating Instructions for additional information.

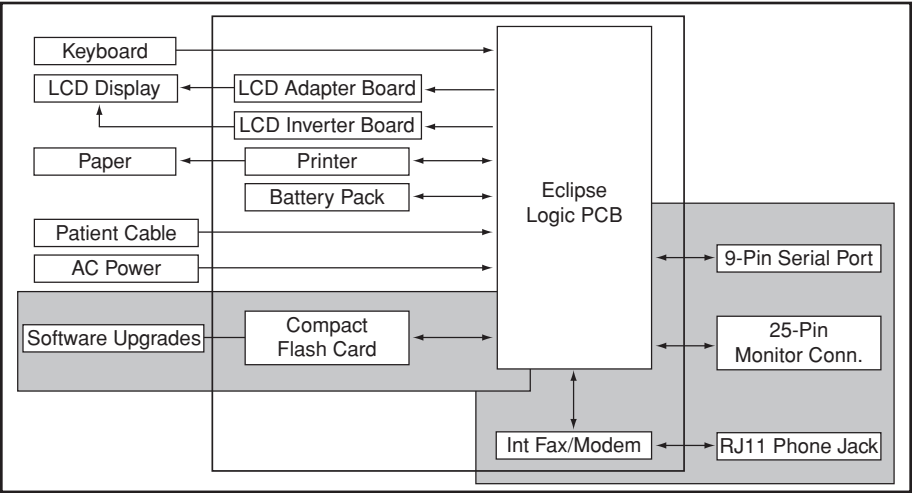
The operation and servicing of the Eclipse Premier electrocardiograph is similar regardless of which model you have. Some of the information in this Service manual applies only to options which you may or may not have installed in your electrocardiograph.

Basic System Description

A simple diagram of the system is shown in Figure 1-1. When AC power is not connected, an internal 16.8VDC battery provides power for all functions. This battery is recharged whenever the AC line is connected.

The ECG data is acquired by hybrid circuits and sophisticated software on the Logic board. Under microprocessor control, the electrocardiograph samples, buffers and amplifies the analog ECG signals before converting them to digital levels for further processing. Input/output control circuitry handles communication with the front end ECG signals, LCD (liquid crystal display), membrane switches, thermal printer and external devices such as a modem or other compatible equipment (if equipped).

Figure 1-1
Basic System Block Diagrams
Eclipse Premier



Technical Data

Dimensions (with cart):	43.5cm x 65.1cm x 125.7cm (17.125" x 25.625" x 49.5")
Weight (with cart):	39.5 kg (87 lbs)
Power Requirements:	
Mains Power Requirement	115/230 V AC $\pm 10\%$, 0.80/0.40 A, 50/60 Hz
Battery Operation	16.8 VDC NiCd battery pack
Fuses:	
F1 and F2 mains	for 115 V, 1.0 A 250 V type T for 230 V, 0.500 A 250 V type T
Environmental:	
Operating Temperature	10° C to 40° C
Storage Temperature	-20° C to 55° C
Relative Humidity	25% to 95% non-condensing
Acquisition:	
Atmospheric Pressure	7×10^4 to 10.6×10^4 Pa
Lead Selection	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6 Supports Frank X,Y,Z; Nehb D,A,J; and Alternate chest lead
Interpretation	diagnosis, measurements, reasons statements
Modes	auto, rhythm, manual
Frequency Response	meets or exceeds ANSI/AAMI EC11-1991 standard
Input Impedance	meets or exceeds ANSI/AAMI EC11-1991 standard
Electrode Offset Tolerance	± 300 mV
A/d Conversion	10 μ V LSB
Storage Resolution:	500 samples/sec, 5 μ V resolution
Artifact Filter Response:	40 Hz, -3dB
Display:	640 x 480 pixel Active-Matrix, Color, Liquid Crystal Display (LCD)
Printout:	
Printout device	216 mm thermal dot array
Paper dimension	8.5" x 11" (US letter) 210mm x 300mm (A4)
Paper type	Thermal sensitive (Burdick Assurance® or Heartline™ paper recommended)
Chart speeds	10, 25, 50 mm/sec
Gain	5, 10, 20 mm/mV Chest or Limb (may be split)
Printout formats	3, 4, 6 or 12 channels; additional rhythm formats

Input/Output:

- standard RS-232 (9 pin “D”)
- analog output (DB 25)
- telephone line interface (RJ11C)
- PCMCIA slot (type 3)
- 802.11b wireless ethernet (optional)
- non-standard DB9 with power and RS232
- Class IIa (Council Directive 93/42/EEC, MDD)

Adapter Module (optional)

Equipment Type

Conforms to Standards:

- IEC 601-1/CSA C22.2 no. 601-1-M90
- IEC 601-2-25/CSA C22.2 no. 601-2-25
- IEC 601-1-2
- And, by reference of IEC 601-1-2, conforms to EN 55011-Class A, IEC 801-2, IEC 801-3, IEC 801-4 and IEC 801-5.
- AZ/NZS 2064.1/2

Safety:

- Leakage Current patient <10µA, chassis <100µA
- Defibrillator Protection to 5000V, 360J

What You Will Need

You will need only standard electronics tools to perform any testing or repairs. Test equipment must be in good condition and calibrated regularly. You will need:

- ✓ Digital Multimeter
- ✓ Leakage Current Meter/Safety Analyzer
- ✓ Electronic Heart Simulator

Before You Begin

A few words of caution are in order. Before you perform any service on the electrocardiograph, be aware of:



High voltage. There can be high voltage near the fuse, power inlet, and transformer. Always unplug the electrocardiograph and remove the battery pack before taking it apart.



Static electricity. The CMOS (complimentary metal-oxide semiconductor) chips on the electrocardiograph's circuit board are extremely sensitive to static electricity. The printhead and LCD are also sensitive to static. To minimize the risk of damage, use a grounding strap and work on an antistatic surface.

Recording paper. Do not use wax-coated or blush-coated paper in the electrocardiograph. It will damage the printhead. Use only approved thermal paper.

Preventive Maintenance

The purpose of preventive maintenance is to reduce or eliminate future problems. Keeping the electrocardiograph in good operating condition ensures that it will perform safely and provide accurate recordings.

At least once a year, you should:

- ✓ Visually inspect the electrocardiograph
- ✓ Clean the electrocardiograph
- ✓ Check the power cord
- ✓ Check the patient cable
- ✓ Check the leakage currents

If a repair is required, only qualified technicians should do the work.

Visual Inspection

Check for anything out of the ordinary. Are there any cracks or missing parts? Are the cords and connectors damaged or weak? Does the electrocardiograph seem to operate properly? If everything looks fine, but you still suspect a problem, check inside the electrocardiograph for loose connections, burn damage or contamination from liquids.

Cleaning



CAUTION: Always turn the electrocardiograph off and disconnect the power cord before cleaning. Do not pour liquids (such as alcohol or other cleaners) on the unit. This will cause severe electrical damage!

The need for cleaning depends on the environment and how often the electrocardiograph is used. Use a damp cloth to clean the housing. Avoid abrasive cleaners or polishes. Wipe dry with a soft, clean cloth. Don't forget to wipe the paper compartment.

Power Cable

Check the power cord and AC inlet for any visible signs of deterioration, loose connections or burn damage.

Patient Cable

Check the patient cable and input connector for any visible signs of damage or loose connections. Disconnect the patient cable from the unit and inspect it for short circuits, broken wires or poor contacts by measuring the resistance for individual electrode leads.

Printhead

Keep the thermal array printhead free of dirt and other foreign materials.



WARNING: The printhead is very sensitive to static electricity. Use an antistatic work surface.

Individual dots or groups of dots which do not print (particularly at the baseline) are an indication that the printhead is dirty. Use a small amount of rubbing alcohol and a lint-free swab to remove residue. Avoid abrasives or cleaners which may damage the printhead.

Calibrating the Battery

Battery calibration is required prior to initial use and at regular intervals, to ensure optimal performance. Additionally, battery calibration is required whenever a new battery is placed in the Eclipse Premier or whenever the battery is removed and reinstalled.

Battery calibration consists of 2 phases: charging the battery; and completely discharging a fully charged battery.

Charge the battery:

1. Connect AC power. Power down to Standby mode to fully recharge the battery (0 to 4.5 hours).

NOTE: You may operate the Eclipse Premier from AC line power while the battery is charging. However, this will increase charging time. Additionally, the unit must return to Standby mode to finish recharging.

2. The unit will power off automatically once the battery is fully charged.

Completely discharge a fully charged battery:

3. Unplug the Eclipse Premier from AC line power.
4. Press ON/STBY to turn the Eclipse Premier on.
5. Press M to go to the Main menu. Press B, then press Enter.
6. Press the left arrow key to return to the PREVIEW screen, and verify that the battery gauge states "CALIBRATING".
7. Leave the unit on until it powers off automatically. You may operate the Eclipse Premier while the battery is discharging.



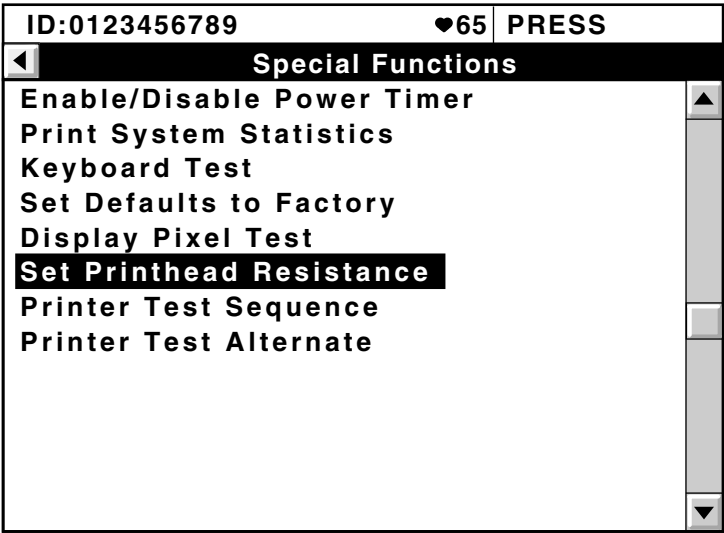
Battery calibration is complete. Connect the unit to AC line power to recharge the battery.

Using the Special Functions Menu

The Eclipse Premier electrocardiograph has a Special Functions menu which you access by pressing a specific key combination. The special functions listed enable you to perform various tests to verify proper operation. This is also the location where you set the resistance of the printhead to the correct value.

Enter the Special Functions menu from the Main Menu by simultaneously pressing the ,  and  keys.


You will then see a list of special functions which looks similar to this:



NOTE: There may be other functions in addition to those shown here. They are included for Quinton Cardiology, Inc. Engineering use only.

Use the up/down arrow keys to highlight the desired function then press .


Enable/Disable Power Timer

This function allows you to temporarily disable the auto power down feature. This will remain in effect until you enable it again from this menu or until  is pressed.

Print System Statistics

This function will print a report of various system information. This information is divided into the following categories: Thermal Printer, Power, Front End, Installed Options, Communications, General, Operating System and Version Information.

Keyboard Test

This function allows you to verify that the keyboard is working properly. When you enter this test, you will see a list of all of the alphanumeric and special characters. Press the corresponding key on the keyboard and, if it is working properly, the display of that character will become an asterisk. Press  to exit the test.

Set Defaults to Factory

This function allows you to set all of the user programmable defaults back to their original factory settings. The Eclipse Premier automatically copies all backup files to the active directories and powers down and back up again to ensure that the new defaults are effective.


Display Pixel Test

This function darkens every pixel on the LCD screen. Use it to verify that the LCD is functioning properly.

Set Printhead Resistance

Because individual printheads vary in resistance, you must enter the printhead resistance whenever the storage module, logic PCB or paper drive assembly has been replaced.

To enter the printhead resistance:

1. Highlight **Set Printhead Resistance** and press .
2. Compare the displayed value to the value written on the printhead.


NOTE: To see the resistance value printed on the printhead, you must press down on the paper guide.

3. If the displayed value is incorrect, press backspace three times to erase the current setting and type in the value printed on the printhead.



CAUTION: Setting the printhead resistance to any value other than the value written on the printhead will shorten the life expectancy of the printhead and may void your warranty.

Printer Test Sequence/Printer Test Alternate

These functions print out a series of test pages which you can use to verify that the printer is printing correctly across the full width of the printhead. **Printer Test Sequence** prints 4 pages. **Printer Test Alternate** prints continuously until you press .

Measuring Chassis Leakage Current

Use a high quality meter or safety analyzer capable of testing to AAMI specifications. An inappropriate meter can produce erroneous leakage readings. Do the leakage tests at a nonconductive work station.



Be careful! The meter must be suitably insulated and capable of withstanding the power line voltage.

To check the chassis leakage current:

1. Connect a leakage meter between the chassis ground jack (at rear panel) and power line ground. Make sure the leakage current is less than $300\mu\text{A}$.
2. Open ground line and verify that leakage current is less than $300\mu\text{A}$.
3. Reverse line polarity and verify that leakage current is less than $300\mu\text{A}$ with ground closed.
4. With reversed polarity, open ground line and ensure leakage is less than $300\mu\text{A}$.

Measuring Patient Leakage Current

Use a high quality meter or safety analyzer capable of testing to AAMI specifications. An inappropriate meter can produce erroneous leakage readings. Do the tests at a nonconductive work station.



Be careful! The meter must be suitably insulated and capable of withstanding the power line voltage.

To check the patient leakage current:

1. Connect the patient cable to the Eclipse Premier.
2. Connect all patient cable leads together (it's easiest to use a safety analyzer).
3. Connect a leakage meter between patient cable leads and power line ground. Make sure the leakage is less than $10\mu\text{A}$.
4. Open ground line and verify that leakage current is less than $10\mu\text{A}$.
5. Reverse line polarity and verify that leakage current is less than $10\mu\text{A}$ with ground closed.
6. With reversed polarity, open ground line and ensure leakage is less than $10\mu\text{A}$.

Troubleshooting

Past experience shows that most service calls are due to poor ECG technique or broken cables. Before you take apart the electrocardiograph, make sure that these things are not causing the problem. Make use of the Operating Instructions manual. It contains useful information!

The following table should help you trace problems to a particular assembly. The possible causes are listed in order of probability.

Symptom:	Possible cause:	Procedure:
No power on indication (green light on back panel)	- No AC at outlet	- connect Eclipse Premier to working AC outlet
	- power line fuse F1 or F2 open	- replace blown fuse
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective main PCB	- replace main PCB
	- defective transformer	- replace transformer
No battery charge indication	- defective battery pack	- replace battery pack
	- battery pack not plugged into unit	- ensure battery pack is plugged in
	- defective power supply I/O PCB	- replace power supply I/O PCB
Battery status does not indicate full charge when battery is fully charged	- battery status gauge not calibrated	- calibrate battery status gauge (Chapter 2)
	- end of battery life	- replace battery pack
	- defective power supply I/O PCB	- replace power supply I/O PCB
Print motor does not run	- defective or poorly seated print motor cable	- reseal or replace cable
	- defective motor	- replace paper drive assembly
	- defective power supply I/O PCB	- replace power supply I/O PCB
Motor turns but paper does not queue	- dirty queue sensor	- clean queue sensor
	- defective queue sensor	- replace queue sensor
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective or poorly seated queue sensor cable	- reseal or replace cable

Symptom:	Possible cause:	Procedure:
Motor turns but there is no trace or printing	- shock mounts not properly installed	- ensure shock mounts are properly installed
	- defective or poorly seated print head cable	- reseal or replace cable
	- defective printhead	- replace paper drive assembly
	- defective logic PCB	- replace logic PCB
Printing is too light or too dark	- paper type loaded does not match paper type selected in System Setup	- ensure that the paper type selected in System Setup matches the type of paper loaded
	- use of non-approved paper	- replace with approved paper
	- printhead resistance not entered correctly	- enter correct printhead resistance
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective or poorly seated print head cable	- reseal or replace cable
No keypad response	- defective or poorly seated keypad cable	- reseal or replace cable
	- defective keypad	- replace keypad
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective main PCB	- replace main PCB
No LCD display	- no power	- ensure AC cord is plugged into AC source or ensure battery is fully charged
	- LCD connector not properly seated	- ensure LCD connector is pushed all the way in and locked into place
	- keyboard connector not properly seated	- ensure keyboard connector is pushed all the way in
	- defective keypad	- replace keypad
	- defective LCD	- replace LCD
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective LCD adapter board	- replace LCD Adapter board
	- defective or poorly seated LCD adapter board cable	- reseal or replace cable

Symptom:	Possible cause:	Procedure:
No LCD Backlight	- defective CCFL	- replace CCFL
	- defective LCD inverter board	- replace LCD inverter board
	- defective or poorly seated inverter cable or connector	- reseal or replace inverter cable
	- defective power supply I/O PCB	- replace power supply I/O PCB
Dim LCD	- incorrect setting for contrast/ brightness	- toggle contrast/ brightness
		- replace CCFL
		- replace display inverter PCB
Will not store patient data or ECG	- defective main PCB	- replace main PCB
	- defective storage module	- replace storage module
Will not send fax	- optional internal modem not installed/ purchased	- contact customer service to purchase
	- incorrect setup	- set up in accordance with operating instructions
	- defective or poorly seated phone cable	- reseal or replace cable
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective fax/ modem PCB	- replace fax/ modem PCB
Will not communicate with management system	- optional internal modem not installed/ purchased	- contact customer service to purchase
	- incorrect setup	- set up in accordance with operating instructions
	- defective or poorly seated phone or direct connect cable	- reseal or replace cable
	- defective power supply I/O PCB	- replace power supply I/O PCB
	- defective fax/ modem PCB	- replace fax/ modem PCB
	- wireless ethernet not configured or incorrect configuration	- configure in accordance with instructions

Connector Pinouts

You can use the following tables to help locate signals during troubleshooting:

EXTERNAL			
Connector	Pin	Name	Description
DB9	1	CD	Carrier detect
	2	RXD	Receive data
	3	TXD	Transmit data
	4	DTR	Data transmit ready
	5	GND	Ground
	6	DSR	Data set ready
	7	RTS	Request to send
	8	CTS	Clear to send
	9	RI	Ring indicator
PATIENT CABLE	1	V2 (C2)	Chest lead ECG input signal
	2	V3 (C3)	Chest lead ECG input signal
	3	V4 (C4)	Chest lead ECG input signal
	4	V5 (C5)	Chest lead ECG input signal
	5	V6 (C6)	Chest lead ECG input signal
	6	SCREEN	Cable shield
	7	—	Not used
	8	—	Not used
	9	RA (R)	Right arm ECG input signal
	10	LA (L)	Left arm ECG input signal
	11	LL (F)	Left leg ECG input signal
	12	V1 (C1)	Chest lead ECG input signal
	13	—	Not used
	14	RL (N)	Right leg ECG input signal
	15	—	Not used
LINE	1–3	—	AC power inlet
PHONE RJ11	1	—	Not used
	2	—	Not used
	3		Tip
	4		Ring
	5	—	Not used
	6	—	Not used

EXTERNAL (Continued)			
Connector	Pin	Name	Description
DB25	1	GND	Digital Ground
	2	GND	Digital Ground
	3	CTS	802.11b data
	4	RXD	802.11b data
	5	—	Not used
	6	BC_ENA	Barcode Enable
	7	AGND	Analog Ground
	8	AGND	Analog Ground
	9	AGND	Analog Ground
	10	AGND	Analog Ground
	11	AGND	Analog Ground
	12	AGND	Analog Ground
	13	12V	+ 12V
	14	TXD	802.11b data
	15	DTR	802.11b data
	16	—	Not used
	17	802_ENA	802.11b Enable
	18	—	Not used
	19	TTL	TTL Out
	20	ACH1	Analog CH 1 (option)
	21	BAR_TXD	Barcode Data
	22	BAR_RXD	Barcode Data
	23	ACH2	Analog CH 2 (option)
	24	ACH3	Analog CH 3 (option)
	25	ACH4	Analog CH 4 (option)

B8i Module (optional)			
Connector	Pin	Name	Description
DB25	1	GND	Ground
	2	GND	Ground
	3	CTS	802.11b data
	4	RXD	802.11b data
	5	—	Not used
	6	BC_ENA	Barcode Enable
	7	—	Not used
	8	GND	Ground
	9	GND	Ground
	10	GND	Ground
	11	—	Not used
	12	—	Not used
	13	12V	Barcode/802.11b power
	14	—	Not used
	15	DTR	802.11b data
	16	TXD	802.11b data
	17	802_ENA	802.11b Enable
	18	—	Not used
	19	—	Not used
	20	—	Not used
	21	BAR_TXD	Barcode Data
	22	BAR_RXD	Barcode Data
	23	—	Not used
	24	—	Not used
	25	—	Not used

B8i Module (optional)			
<i>Connector</i>	<i>Pin</i>	<i>Name</i>	<i>Description</i>
DB9 female barcode	1	12V	Barcode power
	2	BAR_TXD	Barcode data
	3	BAR_RXD	Barcode data
	4	—	Not used
	5	GND	Ground
	6	—	Not used
	7	—	Not used
	8	—	Not used
	9	—	Not used
DB9 male wireless	1	—	Not used
	2	R1IN	802.11b data
	3	T1OUT	802.11b data
	4	—	Not used
	5	GND	Ground
	6	—	Not used
	7	T2OUT	802.11b data
	8	R2IN	802.11b data
	9	12V	802.11b power

This section contains instructions for removing and replacing the Eclipse Premier electrocardiograph's major subassemblies. To find an assembly, refer to "Parts Lists & Exploded Views" on pg. 4-6.



WARNING: *There can be high voltage near the fuse, AC inlet and transformer. Always unplug the electrocardiograph before taking it apart.*



CAUTION: *Several of the electrocardiograph's components are extremely sensitive to static electricity. To minimize the risk of damage, use a grounding strap and work on an antistatic surface.*

NOTE: When you remove an assembly, pay close attention to the wire and connector positions. This will make it easier to put back together!

Battery Pack

1. Unplug the electrocardiograph.
2. Remove the back panel. There are three (3) screws.
3. Disconnect the battery by grasping the connector and sliding it straight out. **DO NOT PULL ON THE WIRES!**
4. Disconnect the battery thermistor connection at the PCB by grasping the connector and sliding it straight out.
5. Replace in reverse order. *Be careful to arrange the wires so that they do not interfere with the bracket.*

NOTE: After replacing the battery pack, follow the instructions under "Calibrating the Battery" on pg. 2-3.

LCD



CAUTION: *The display is very sensitive to static electricity. Use a grounding strap and work on an antistatic surface.*

1. Unplug the electrocardiograph.
2. Remove the battery pack as described earlier.
3. Remove the ten (10) screws from the back panel of the LCD enclosure.

CAUTION: *Make sure the display does not hang by the cables.*

4. Remove ribbon cable to LCD backlight inverter.
5. Remove Adapter board. There is one (1) screw.
6. Remove the grounding wire from the back plate. There is one (1) nut.
7. Remove wires from the backlight to LCD backlight inverter.
8. Remove LCD panel. There are four (4) screws and four (4) spacers.
9. Replace in reverse order. *Ensure lens is installed with non-glare side out.*

Display Bulb or Florescent Tube

1. Remove LCD as described earlier.
2. Push down on the tab to release the backlight and slide the lamp out.
3. Replace in reverse order.

Electronics Enclosure

1. Unplug the electrocardiograph.
2. Remove the electrocardiograph from the cart. There are four (4) allen screws.
3. Remove the battery pack as described earlier.
4. Remove the patient cable bezel on the front panel. There are two (2) screws.
5. Remove the front panel. There are three (3) screws.
6. Remove the rear panel. There are three (3) screws.
7. Remove the electronics enclosure. There are ten (10) screws. Remove five (5) ribbon cables from the board.
8. Replace in reverse order. *Ensure all cables are fully seated before closing enclosure.*

Power Supply I/O PCB



CAUTION: *The power supply I/O PCB is very sensitive to static electricity. Use a grounding strap and work on an antistatic surface.*

1. Remove the electronics enclosure as described earlier.
2. Remove the board from the enclosure. There are eight (8) screws.
3. Disconnect the two (2) transformer cables from the logic board and remove the four (4) ribbon cables.
4. Lift the logic board from the enclosure.
5. Replace in reverse order. *Ensure all wires are properly routed before reinstalling power supply I/O PCB.*

Main Board



CAUTION: *The main board is very sensitive to static electricity. Use a grounding strap and work on an antistatic surface.*

1. Remove the electronics enclosure as described earlier.
2. Unplug the keyboard ribbon cable and the 34 pin ribbon cable at the main board.
3. Remove the board from the enclosure. There are five (5) screws.
4. Replace in reverse order. *Ensure all wires are properly routed before reinstalling main board.*

NOTE: After you replace the main board, you must enter the printhead resistance into the software; see “Set Printhead Resistance” on pg. 2-5.

Paper Drive Assembly

NOTE: The paper drive assembly is replaced as a unit. Do not disassemble.



CAUTION: *The printhead is very sensitive to static electricity. Use an antistatic work surface.*

1. Remove electronics enclosure as described earlier.
2. Remove the paper compartment lid by pulling it firmly out to the left. Remove the paper.
3. Remove display post from the base plate. There are four (4) allen screws.
4. Remove paper drive from base plate. There are four (4) screws/
5. Remove base plate from console. There are eight (8) screws.
6. Disconnect the grounding strap at the printhead.
7. Lift paper drive from console.
8. Replace in reverse order. *Ensure two (2) rubber grommets are installed on the frame of the paper drive.*

NOTE: After you replace the paper drive assembly, you must enter the printhead resistance into the software. See "Set Printhead Resistance" on pg. 2-5.

Queue Sensor

1. Remove paper drive as described earlier.
2. Disconnect ribbon cable from queue sensor.
3. Remove queue sensor by squeezing the sides together and pushing it out of the slot.
4. Replace in reverse order.

Keyboard

1. Remove the electronics enclosure as described earlier.
2. Remove the paper compartment lid by pulling it firmly out to the left. Remove the paper.
3. Remove display post from the base plate. There are four (4) allen screws.
4. Remove paper drive from base plate. There are four (4) screws.
5. Remove base plate from console. There are eight (8) screws.
6. Remove the keyboard bracket. There are fourteen (14) screws.
7. Replace in reverse order. *Ensure all cables are routed through the base plate before securing to the console.*

Transformer

1. Remove the electronics enclosure as described earlier.
2. Unplug two (2) connectors from the transformer to the power supply I/O PCB.
3. Remove the four (4) screws holding down the transformer.
4. Replace in reverse order.

Fuses

There are two (2) fuses on the power supply I/O board. You must remove the electronic enclosure as described earlier to reach them. Always use fuses of the same type and rating as the originals; see page 1-3 for recommended fuses.

Parts Lists & Exploded Views

To locate components, refer to the figure on page 4-7 and this parts list:

Item #	Part #	Quantity	Description
1	650-1454-00	1	Console
2	862949	2	HingePin
3	650-1455-00	1	Platen Carrier Assembly
4	437-5056-00	1	Display Enclosure
5	863675	1	Display Lens
6	844310	4	Spacer
7	010-1670-00	1	Color LCD
8	701955	4	Screw
9	019-0498-00	1	Backlight Module
10	050-0429-00	1	Display Inverter Bracket Assembly
11	670-1010-01	1	LCD Adapter Board
12	017-0103-00	1	LCD Backlight Inverter
13	701957	12	Screw
14	701958	4	Screw
15	175-1402-00	1	LVDS Display Cable
16	175-1605-00	1	Inverter Cable
17	120-0255-00	1	Transformer, 120V
	120-0256-00	1	Transformer, 220V
18	407-0604-00	1	Battery Bracket
19	146-0100-00	1	Battery
20	671-1013-00	1	Fax/Modem PCB Assembly
21	863855	1	FE/Digital to PS Ribbon Cable
22	701955	13	Screw
23	671-1002-04	1	Main PCB
24	407-0750-00	1	Strain Relief Bracket
25	701955	2	Screw
26	671-1001-01	1	Power Supply
27	833117	2	1 Amp. Fuse (120V Unit)
	833088	2	.5 Amp Fuse (220V Unit)
28	437-5052-00	1	Enclosure Front
29	203-0233-00	1	Patient Connector Bezel
30	700218	2	Screw
31	701956	16	Screw
32	437-5051-00	1	Enclosure
33	437-5053-00	1	Enclosure Rear

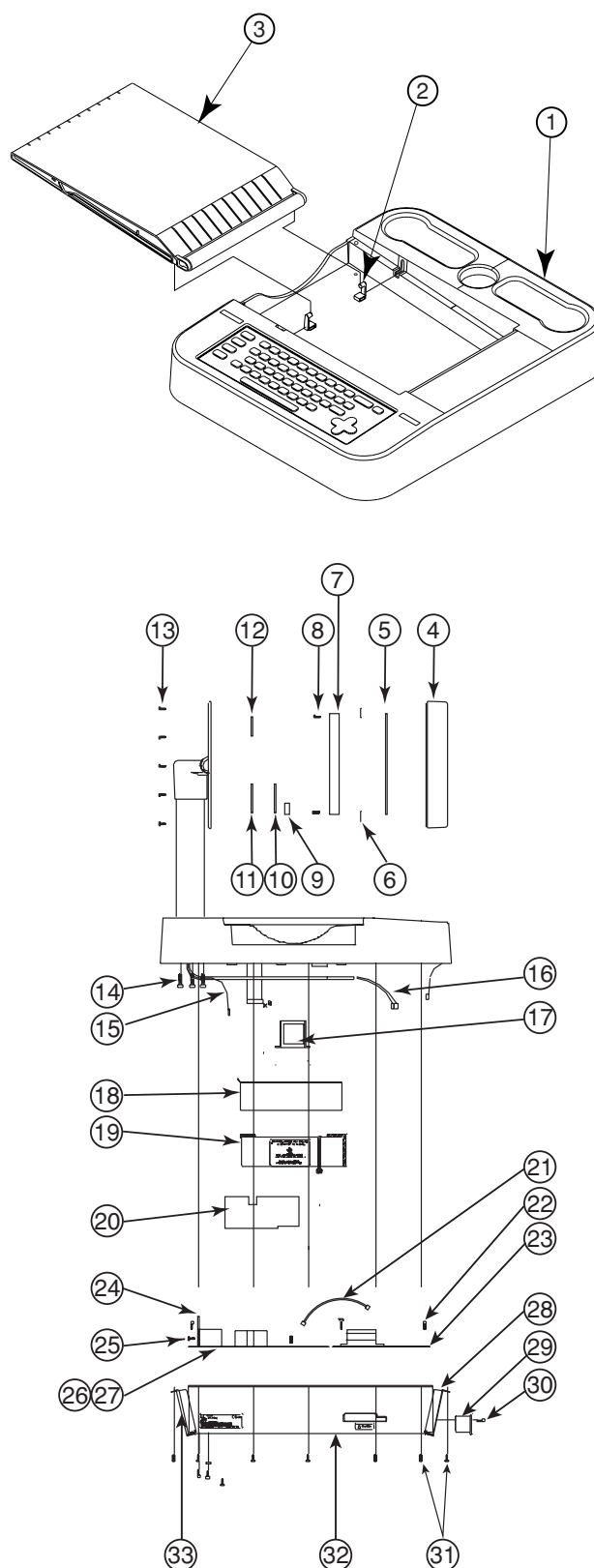


Figure 4-1

Parts Lists and Exploded Views (cont.)

To locate components, refer to Figure 4-2 on pg. 4-9 and this parts list:

Item #	Part #	Quantity	Description
34	862955	2	Shock Mount Paperdrive
35	863193	1	Queue Sensor Assembly
36	650-1002-00	1	Printer Assembly
37	175-1404-00	1	Printer Cable
38	119-0492-00	1	Keyboard
39	863573	1	Keyboard Spacer
40	863574	1	Keyboard Plate
41	701956	14	Screw
42	863329	1	Substrate Plate
43	701956	12	Screw
44	800570	1	Foam
45	863793	2	Extruded Handle
46	702102	4	Screw
47	882166	2	Cord Wrap
48	436-0237-00	1	Shelf
49	436-0236-00	1	Paper Tray Shelf
50	863602	4	Caster Base Endcap
51	847938	2	5" Swivel Caster
52	702205	4	Screw
53	847939	2	5" Direct Lock Caster

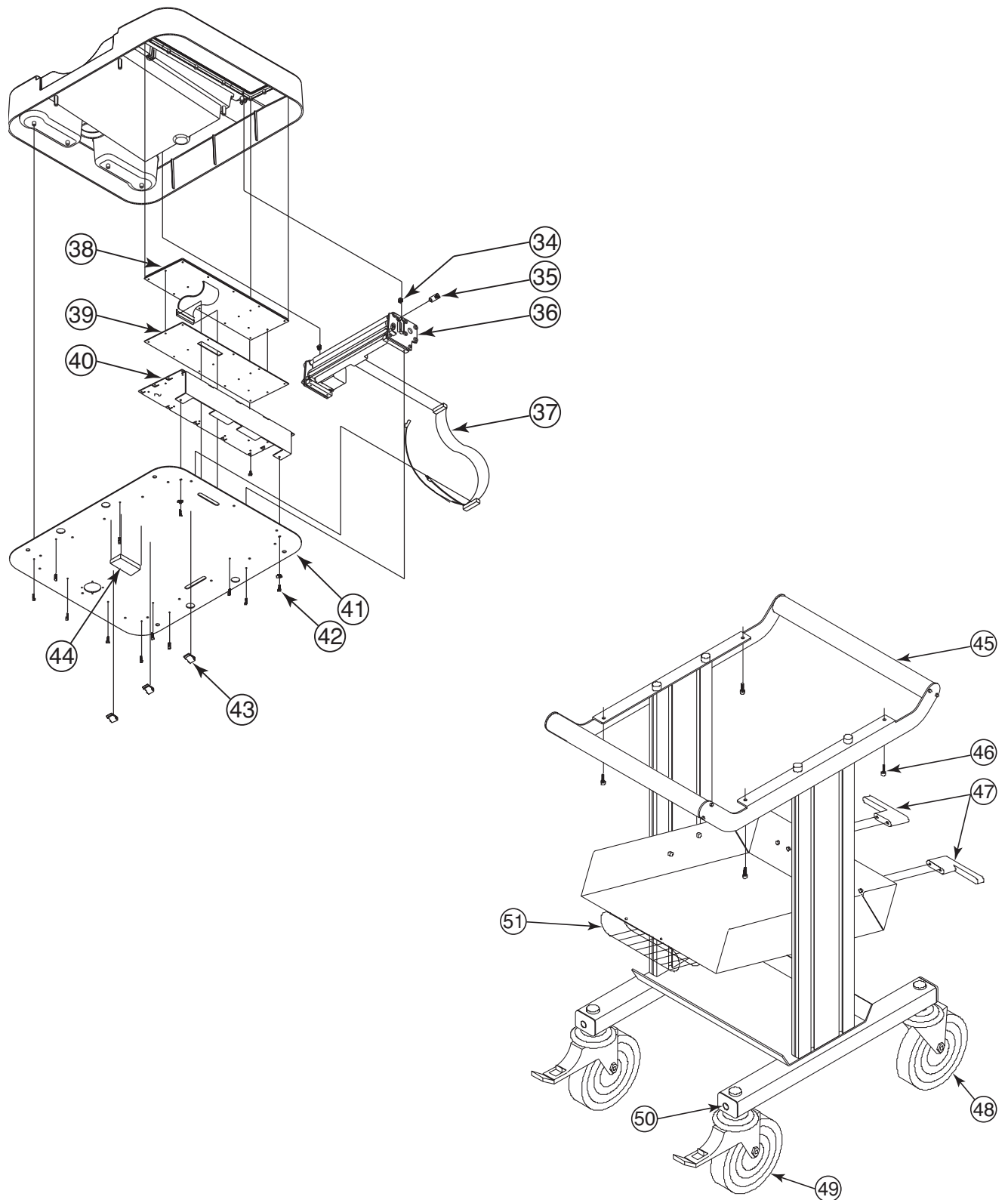


Figure 4-2

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